BY ORDER OF THE COMMANDER
AIR FORCE MATERIEL COMMAND

AIR FORCE MATERIEL COMMAND
INSTRUCTION 63-1201

14 OCTOBER 2009

Acquisition

IMPLEMENTING OPERATIONAL SAFETY SUITABILITY AND EFFECTIVENESS (OSS&E) AND LIFE CYCLE SYSTEMS ENGINEERING (LCSE)

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

ACCESSIBILITY: Publications and forms are available on the e-publishing website at **www.e-publishing.af.mil** for downloading or ordering.

RELEASABILITY: There are no release restrictions on this publication.

OPR: AFMC/ENS

Certified by: AFMC/ENS
(Kevin Stamey)

Supersedes: AFMCI 63-1201, 22 March 2007

Pages: 43

This instruction implements Air Force Policy Directive (AFPD) 63-1, *Capability-Based Acquisition System*, AFPD 16-10, *Modeling and Simulation*, Air Force Instruction (AFI) 63-101, *Acquisition and Sustainment Life Cycle Management*, AFI 63-103, *Joint Air Force-National Nuclear Security Administration (AF-NNSA) Nuclear Weapons Acquisition*, and updates Air Force Materiel Command (AFMC) implementation of AFI 63-1201, *Life Cycle Systems Engineering*. This Air Force Materiel Command Instruction (AFMCI) assigns AFMC responsibilities and provides implementing guidance and standards for LCSE and OSS&E and is subordinate to Department of Defense (DoD) and Air Force (AF) instructions.

This instruction applies to all AFMC Centers and the Air Force Research Laboratory (AFRL), and their regular Air Force and Air Force Reserve elements. This AFMCI applies to development, acquisition, and sustainment programs and projects, as well as Test and Evaluation (T&E) enterprise investment & modernization (I&M) efforts. It applies to all programs and projects which may result in a usable system, sub-system or end item, from concept development through disposal. The primary purpose of this AFMCI is to ensure disciplined Systems Engineering (SE) processes and principles are applied across all phases of a program/project over its life cycle. Special Access Programs/Special Access Required (SAP/SAR) and classified programs will comply with this instruction consistent with applicable security restrictions and guides. Exceptions for alternative compliance will be documented and reported within classified and/or SAP/SAR channels. Any other waiver requests or deviations to this publication must be

approved by HQ AFMC/EN. Programs that are unable to comply with policy due to funding or other limitations should request a waiver.

Send proposed supplements or recommended changes for this instruction to: HQ AFMC/EN, 4375 Chidlaw Road, Wright-Patterson Air Force Base, Ohio, 45433-5006; or email **HQAFMC.EN.EXEC@wpafb.af.mil**. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with Air Force Manual (AFMAN) 33-363, *Management of Records*, and disposed of in accordance with Air Force Records Information Management System (AFRIMS) Records Disposition Schedule (RDS) located at **https://www.my.af.mil/gcss-af61a/afrims/afrims**/.

SUMMARY OF CHANGES

Due to major changes in Air Force policies and additional specific guidance for organizational systems engineering implementation, this instruction is substantially revised and must be completely reviewed. The updated policy identifies specific organizational responsibilities by center as well as specific requirements for program managers and chief/lead engineers. Guidance for test centers and AFRL is the most notable difference. Another substantial change is the alignment with the AF Systems Engineering Assessment Model.

1. LCSE including OSS&E

1.1. Systems Engineering (SE): SE encompasses the entire set of scientific, technical, and managerial efforts needed to conceive, evolve requirements, develop, verify capabilities, deploy, support, sustain, and dispose of a robust product, platform, system, or integrated System-of-Systems/Family-of-Systems (SoS/FoS) capability to meet user needs. SE may be referred to as a discipline, a methodology, an approach, a practice, a process, a set of processes and sub-processes, or various other terms; however, its fundamental elements –

systematic technical and managerial processes and measurements – remain the same regardless of the collective nomenclature. SE provides the integrating technical and managerial process to define and balance performance, cost, schedule, risk, supportability, and security for an item, system, and SoS/FoS throughout their life cycle. SE requires an interdisciplinary execution approach.

1.2. LCSE: Tailored application of SE fundamentals must begin at concept inception and continue through and across life cycle phases (user needs identification through disposal). SE decisions can be made at any life cycle phase and will affect the cost, schedule and performance of the item, system, and SoS/FoS. Key decisions made early have significant impact through the life cycle. LCSE emphasizes disciplined technical planning, organization, and execution of integrated SE efforts necessary to balance research, development, acquisition, T&E and sustainment organizations (including regeneration and disposal organizations) to ensure delivered products meet users' expectations.

1.3. OSS&E**:** The AF assigns OSS&E responsibilities to preserve operational safety, suitability, and effectiveness of systems, sub-systems, and end items throughout their operational life. The OSS&E baseline for all operational systems shall be documented in the OSS&E Baseline Document (OBD). This documentation identifies policy and guidance to address processes and technical data, including specifications and standards, for ensuring preservation of baseline OSS&E characteristics of systems and end items. These processes and standards may be tailored to individual programs in the AF product lines (aircraft, weapons, command and control [C2], Intelligence, Surveillance & Reconnaissance [ISR], and space), as well as to Air Logistics Centers (ALCs) for maintenance and sustainment issues. Data management systems must be compatible with the Logistics Enterprise Architecture as established by HQ USAF/A4/7 and the AF Acquisition Enterprise Architecture as established by SAF/AQ. Characteristics of an effective OSS&E approach are:

1.3.1. Establish an OSS&E baseline including definition of characteristics necessary to ensure operational safety, suitability, and effectiveness using MIL-HDBK-514, *Operational Safety, Suitability, and Effectiveness for the Aeronautical Enterprise*, as a guide.

1.3.2. Delivery of systems, sub-systems, and end items with a baseline enabling OSS&E.

1.3.3. Preservation of OSS&E baseline characteristics of systems, sub-systems, and end items over their operational life.

1.3.4. Updating of OSS&E baselines when making modifications or changes to systems, sub-systems, or end items.

1.4. Relationship between OSS&E and LCSE: LCSE decisions must enable a system, sub-system, or end item to remain operationally safe, suitable, and effective throughout its life cycle. The OSS&E approach and OBD are vital communication tools between acquisition and sustainment offices to ensure SE processes are addressing life cycle considerations. The OBD provides a current approved configuration, technical orders and safety assessments.

1.5. OSS&E responsibility: Responsibility for ensuring OSS&E is assigned to a system, sub-system, or end item System Program Manager (SPM) with support from the Chief Engineer (CE)/Lead Engineer (LE). Per AFI 63-101, the SPM is the DoD Directive 5000.01,

The Defense Acquisition System, designated individual with the responsibility for and authority to accomplish program objectives for development, production, and sustainment to meet the user's operational needs. SPMs and CEs for programs, systems, and end items in sustainment must continue rigorous application of SE principles. Decision makers must assess all relevant aspects of SE performance during program reviews, with a focus on ensuring OSS&E of those systems.

1.5.1. An SPM has OSS&E responsibility for a system, sub-system, or end item; Peculiar Support Equipment (PSE) required to sustain a system, sub-system, or end item; sub-systems and components that comprise a system or PSE; and integration of any government furnished equipment (GFE), payload, cargo, or other item that interfaces with a system, sub-system, or end item. The SPM can be located at either a Product Center or Logistics Center.

1.5.2. The CE is a SPM's chief technical authority for systems. The CE leads the implementation of a program's SE processes and is accountable to the SPM for ensuring the integrity of those processes, including technical risk assessment focused on ensuring OSS&E of an assigned system. The CE is a System's technical authority for all PSE, GFE, subsystems and components, and integration of any payload, cargo, or other item that interfaces with the system. The CE will provide a technical assessment to the SPM for commercial or government managed sub-systems and end items intended to be either temporarily or permanently installed on a system, interface with a system, or used to manufacture or maintain a system. Only one CE is assigned to a system, although one CE can support multiple systems.

1.5.3. The LE is the delegated technical authority for sub-systems or end items, and provides technical support to CEs. A LE cannot assume technical accountability for system level assessments or certifications. Multiple LEs can provide technical support to a CE, and a LE can support multiple CEs. The LE must coordinate all subsystem or end item modifications with the CEs for the affected systems. The LE ensures sub-system or end item technical processes enable system level OSS&E.

1.5.4. Delegation of OSS&E responsibilities shall be clearly documented and consistent with the roles and responsibilities in this AFMCI. Specific OSS&E responsibilities shall be documented in writing and approved by the SPM/CE, as well as the delegated organization.

1.6. SE Processes:

1.6.1. The SE processes listed below correspond to those listed in the Air Force Systems Engineering Assessment Model (AF SEAM). The model identifies standard SE process areas that should be used as a foundation to build SE processes. Programs listed in the Air Force Systems Information Library (AFSIL) shall use AF SEAM as a self assessment tool to evaluate the organization's capability to perform SE processes. Other development, acquisition, sustainment and disposal programs and projects are highly encouraged to use AF SEAM as a self assessment tool. Additional information about these processes, minimum requirements, and required artifacts is contained in **Attachment 2**.

1.6.1.1. Configuration Management (CM)

1.6.1.2. Decision Analysis

1.6.1.3. Design

1.6.1.4. Manufacturing

1.6.1.5. Project Planning

1.6.1.6. Requirements

1.6.1.7. Risk Management

1.6.1.8. Sustainment

1.6.1.9. Technical Management and Control

1.6.1.10. Verification and Validation (V&V)

1.7. Concept Development:

1.7.1. All AFMC organizations that develop pre-program materiel concepts shall establish standard processes to translate needed operational capability into conceptual descriptions and/or technologies. These processes shall be documented in a concept development (CD) organizational operating instruction (OI). The *Early Systems Engineering Guidebook* by SAF/AQ should be used as a reference to construct a CD OI. CD OIs shall be updated and approved annually.

1.7.2. All Air Force efforts (contracted or otherwise) to develop pre-program materiel concepts shall be governed by the CD OI.

1.7.3. Concept technical baselines shall be documented in a manner consistent with the *Early Systems Engineering Guidebook*. The Concept Characterization and Technical Description (CCTD) from the Guidebook is the recommended template.

1.7.4. For concepts developed by non-Air Force entities, the sponsoring AF organization shall ensure that concept developers provide documentation consistent with the CD OI.

1.8. Program Guidelines: AFMC programs operating under the Department of Defense Instruction (DoDI) 5000.02 *Operation of the Defense Acquisition System*, or any other authority, shall follow the policy below regardless of the name of particular milestones, phases or technical reviews.

2. Responsibilities and Authorities

2.1. The Center/AFRL Commander or equivalent shall:

2.1.1. Appoint a Center-level Technical Authority. Within AFRL the Center-level Technical Authority referred to in this paragraph, and throughout this document, is the AFRL Technical Engineering Authority.

2.1.2. Advocate for resources necessary to conduct and sustain comprehensive SE processes and procedures.

2.2. Each Center-level Technical Authority shall:

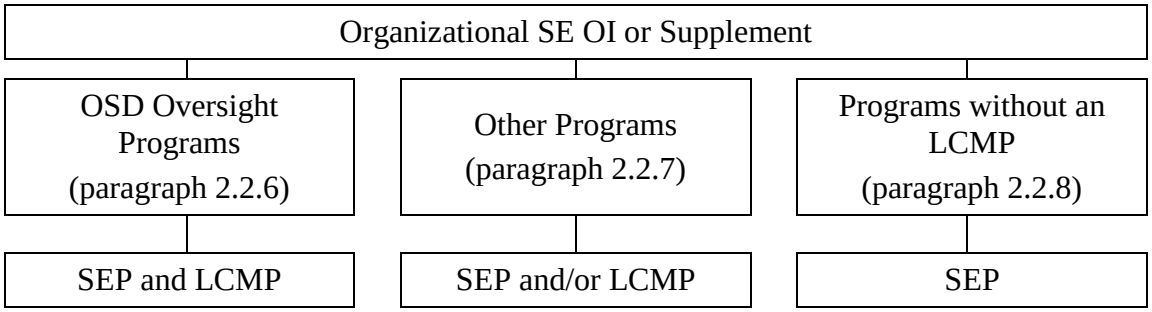
2.2.1. Ensure each Center organization follows this AFMCI.

2.2.2. Ensure implementation of standard SE processes across all Center programs and projects.

2.2.3. Ensure SE documentation (System Engineering Plans (SEPs), OIs, Supplements, and Life Cycle Management Plans (LCMPs), Life-Cycle Signature Support Plans (LSSPs)) is reviewed annually and updated as required.

2.2.4. Ensure documentation of program or project SE processes as shown in Figure 2.1 and described below.

Table 2.1. SE Documentation Requirements



2.2.5. Ensure AFMC organizations implement Organizational SE OIs or Supplements IAW AFMC/EN and SAF/AQR direction.

2.2.5.1. Centers with diverse sub-organizations may choose to issue the organizational SE OIs at lower organizational levels.

2.2.5.2. Each organizational SE OI shall identify all subordinate organizations, and programs to which it applies.

2.2.5.3. Intent is to maximize the use of standard SE processes while reducing the number of redundant documents.

2.2.5.4. Programs are not required to modify approved SEPs until significant updates are required IAW DoDI 5000.02. The SE processes covered in approved SEPs should be consistent with applicable organizational SE OIs.

2.2.6. Ensure OSD oversight programs' (ACAT ID or ACAT IAM and "Special Interest" program of lower ACAT levels) SE processes are documented in program SEPs.

2.2.6.1. While the intent is for the content of OSD oversight programs' SEPs to align under the organizational SE OI or Supplement, these programs are still required to follow all OSD SEP preparation guidance.

2.2.7. Ensure all other programs document SE processes in a SEP and/or an LCMP that is aligned with their organizational SE OI or Supplement.

2.2.8. Ensure programs or projects without an LCMP maintain a SEP that is aligned with their organizational SE OI or Supplement.

2.2.9. Develop and implement Center SE policy consistent with DoD, AF, and AFMC policy. Provide associated "best practice" examples appropriate to the nature of Center programs and implementation of specific processes.

2.2.10. Develop and implement a mechanism that encourages continuous organizational and engineering process improvement.

2.2.11. Ensure use of Modeling and Simulation (M&S) to augment and support design, development and test where appropriate.

2.2.12. Keep the Center-wide workforce current with respect to evolving policies and guidance spanning the processes in this instruction.

2.3. The SPM in coordination with the CE shall:

2.3.1. Document delegation of responsibilities for the Development System Manager (DSM), System Support Manager (SSM), Product Group Manager (PGM), Supply Chain Managers (SCM), CE and LE.

2.3.2. Acquire necessary scientific and engineering resources and ensure they have the knowledge, skills and abilities to accomplish the mission.

2.3.3. Implement policy established by Center-level Technical Authority.

2.3.4. Assume ultimate OSS&E responsibility for the system, sub-system, or end item throughout all phases of the lifecycle which cannot be delegated.

2.3.4.1. Ensure documentation of the OSS&E baseline in the OBD IAW **Attachment 3** for a fielded system, sub-system, or end item.

2.3.4.2. Ensure all assigned personnel understand their role in maintaining OSS&E for the system, sub-system, or end item.

2.3.4.3. Develop and implement program or project SE planning and policy documents.

2.3.4.4. Ensure SE processes and products provide continuing OSS&E assurance.

2.3.4.5. Define when the OSS&E baseline will be brought under configuration control. Once the government owns the baseline, baseline control is the responsibility of the SPM & CE.

2.3.4.6. Coordinate any changes that impact the OSS&E baseline with all customers/users. Notify users of any deviations to critical OSS&E performance baselines – this includes trends that indicate likely deviations to the OSS&E performance baseline.

2.3.4.7. Develop a corrective action plan and report the plan to the Wing, Center EN, and/or Center Commander/Director/Program Executive Officer (PEO)/ Designated Acquisition Official (DAO) for systems, sub-systems, and end items not meeting OBD metrics.

2.3.4.8. Document, update and maintain requirements traceability throughout the life cycle. All reasonable measures should be taken to assure full requirements traceability, even when no development is in progress. Include a statement in the SEP or other appropriate document if data is not available. The CE is also responsible for investigating and documenting user identified changes in operational usage as de-facto requirements baseline changes, and shall adjust the engineering support accordingly.

2.3.4.9. In preparation for the Program Office to move from the Product Center to the responsible ALC, include provisions in the Transfer Support Plan to move OSS&E responsibility, SEP documentation, data, OBD, configuration baseline and processes from the Product Center to the responsible ALC. This must be accomplished in conjunction with SSM or DSM and LEs. Additional information on the Transfer Support Plan can be found in AFI 63-101.

2.3.4.10. Ensure documentation of external interfaces in requirements and system's DoD Architecture Framework (DoDAF) views. If DoDAF data is not available include a statement in the SEP and/or LCMP addressing the issue.

2.3.4.11. Ensure SoS/FoS/enterprise impacts are analyzed and considered when designing the system, sub-system, or end item.

2.3.4.12. Develop and execute a plan for defining and maintaining product technical data describing developed and/or acquired technical data. Technical data shall be suitable to implement documented product support strategy and shall be preserved throughout the system, sub-system, or end item life cycle.

2.3.4.13. Include software support in the product support strategy and technical data package plan.

2.3.4.14. Develop and implement a process to review, validate and update inspection requirements.

2.3.4.15. Verify and validate changes to inspections, maintenance, and operating procedures prior to approval and publication, and assess operational impacts and burden on maintenance/manpower.

2.3.5. Review the following OSS&E assessments and report to the Wing, Center EN, and/or Center Commander/Director/PEO/DAO annually:

2.3.5.1. System/end item OSS&E risks, issues, and/or trends,

2.3.5.2. Adequacy of program office funding, manpower, and any process limitations that prevent assurance of OSS&E.

2.3.6. Ensure program elements are properly integrated including:

2.3.6.1. Integration of Project Planning, SE, Technical Management, and Control processes with overall program management planning and control.

2.3.6.2. Integrated plans are developed and implemented for product design, manufacturing, integration, test, verification, validation, fielding, support, sustainment and disposal and incorporated into the SEP and/or LCMP where appropriate.

2.3.6.3. Program SEP and/or LCMP content shall be consistent with the processes and practices presented in the *DoD Systems Engineering Plan Preparation Guide*, AFI 63-101, and **Attachment 4** of this document.

2.3.6.4. Programs or projects consistent with the organizational SE OI or Supplement, and not under OSD oversight, may merge the SEP into an LCMP without removing processes covered by the SE OI.

2.3.6.5. Conduct a self assessment to evaluate the programs/projects capability to perform SE processes.

2.3.6.6. Conduct a Technology Readiness Assessment as specified by the *DoD Technology Readiness Assessment Deskbook* and identify Critical Technology Elements (CTEs), associated Technology Readiness Levels, and a Technology Maturation Plan before including a CTE in the product baseline.

2.3.6.7. Provide SE-based technology transition guidance to AFRL and other research organizations, including documentation of trade space decisions for use in subsequent life cycle phases. Provide support to Lead Major Commands (MAJCOMs) in development of AoAs.

2.3.6.8. Involve technical expert support in specialty engineering fields required for the execution of a program, e.g., Human Systems Integration (HSI), intelligence, modeling & simulation, information assurance, electromagnetic interference, structural fatigue, etc. throughout the life cycle of the system, sub-system, or end item.

2.3.6.9. Involve industry, Developmental and Operational test communities, Using Command, and other stakeholders in T&E strategy and test planning.

2.3.6.10. Ensure integration of SE processes between Prime Contractor, System Integrator and supplier organizations.

2.3.7. Ensure the system's/end item's technical baseline integrity by:

2.3.7.1. Developing and documenting strategy and plans for technical baseline management.

2.3.7.2. Requiring traceability of requirements to functional, allocated, and/or product baselines.

2.3.7.3. Maintaining integrity of baselines through recordkeeping and configuration audits.

2.3.7.4. Requiring approved changes to include required updates to certifications, OSS&E baseline, V&V plans and procedures, SoS/FoS capabilities, DoDAF views and supporting information or data.

2.3.7.5. Implementing processes and procedures to retrieve serially tracked item configuration, including plans to transition that tracking to DoD-mandated individual item unique identification (IUID).

2.3.7.6. Retaining responsibility for OSS&E assurance and establishing technical baselines for items of Advanced Technology Demonstration (ATD) or Advanced Concept Technology Demonstration (ACTD)/ Joint Capability Technology Demonstration (JCTD) assets that remain with an operational user in the Lead/Using Commands.

2.3.8. Develop and implement a documented CM process that:

2.3.8.1. Meets the intent of MIL-HDBK-61A, *Configuration Management Guidance*,

2.3.8.2. Is consistent with all supported programs' SE processes,

2.3.8.3. Has a mechanism for tracking every change to a system, sub-system, or end item and has a means to track change implementation,

2.3.8.4. Includes a means for measuring effectiveness of CM processes,

2.3.8.5. Assigns CM responsibilities for government personnel and/or contractors with configuration control authority for system segments or product design,

2.3.8.6. Identifies the SPM as Configuration Control Authority (CCA) for the program or project and requires CCA decisions to be documented,

2.3.8.7. Requires proper use of Engineering Change Proposals (ECPs), to include Class 1 and Class 2 types of changes,

2.3.8.8. Requires formal CM training for personnel, who have CM responsibilities,

2.3.8.9. Requires Configuration Items and related documentation be uniquely identified,

2.3.8.10. Requires configuration control of internal and external interfaces,

2.3.9. Establish a Configuration Control Board (CCB) to maintain technical baselines while accommodating technically sound configuration changes, consistent with AFI 63-1101, *Modification Management*:

2.3.9.1. Identify CCB membership and responsibility by name and functional area,

2.3.9.2. Document CCB decisions and supporting rationale, AFMC Form 518 may be used,

2.3.9.3. Maintain access to requirements documents, DoDAF views, hardware and software specifications, manufacturing drawings, TOs, supporting data and approved changes for all systems/end items in production or operational use,

2.3.9.4. Requires system/end item CCB review for temporary modifications to the system, sub-system, or end item,

2.3.9.5. Requires system/end item CCB review for Class I changes, (i.e. changes that affect form, fit, function, reliability, maintainability) to any sub-system, System Specification, or Prime/Critical Item Development Specification,

2.3.9.6. Requires system/end item CCB review for evaluation of ECPs for impacts to applicable certifications, OSS&E baseline, V&V plans and procedures, SoS/FoS interfaces, DoDAF views and supporting information or data.

2.3.10. Require a standard process for configuration status accounting system that:

2.3.10.1. Captures and maintains functional, allocated and product baseline information, including historical technical data,

2.3.10.2. Ensures retrieval of current and accurate configuration information, including baseline information, changes, deviations and waivers,

2.3.10.3. Provides an audit trail of configuration control activity from original requirements documentation to current baselines,

2.3.10.4. For legacy systems with insufficient data, incorporate section 2.3.9 to the fullest extent possible, especially for critical safety items.

2.3.11. Develop and implement a deficiency reporting process that:

2.3.11.1. Ensures deficiency notification, tracking, reporting and resolution is implemented and exercised IAW Technical Order (TO) 00-35D-54, *USAF Deficiency Reporting and Investigation System*,

2.3.11.2. Ensures deficiencies identified during formal system level V&V events are reported by the Test Center and tracked in the program's deficiency reporting system,

2.3.11.3. For items managed by another Service or by Defense Logistics Agency (DLA), coordinate resolution of Product Quality Deficiency Reports (PQDRs) with the appropriate system, sub-system and end item managers.

2.3.12. Develop and implement Quality Assurance processes that meet the requirements in AFI 63-501, *Air Force Acquisition Quality Program*, and AFMCI 63-501, *AFMC Quality Assurance,* and:

2.3.12.1. Provide quality standards for both hardware and software,

2.3.12.2. Include process for identification and management of critical safety items IAW the most current version of MIL-STD-882, *Standard Practice for System Safety*,

2.3.12.3. Where appropriate, provide first article test and quality requirements for items managed by any AFMC Center, another Service or DLA,

2.3.12.4. Include a process to allow use of other Services' approved source of supply,

2.3.12.5. Implement applicable practices described in MIL-HDBK-896, *Manufacturing and Quality Program*, and ASC *Manufacturing Development Guide.*

2.3.12.6. Define contractual requirements for identifying and documenting manufacturing processes, expected variability, critical spares, product acceptance criteria, and quality control capabilities.

2.3.13. Develop and implement a plan to identify, mitigate risk, and report counterfeit parts.

2.3.14. For procurement and repair actions, provide complete and current:

2.3.14.1. Detailed first article test requirements,

2.3.14.2. Product acceptance requirements,

2.3.14.3. Quality requirements,

2.3.14.4. Technical data package

2.3.15. Develop and implement test readiness certification processes and templates for all required test events per AFMCI 99-103, *Test Management*.

2.3.16. Develop and implement a risk management process that meets the intent of the *Risk Management Guide for DoD Acquisition.* Additional information on risk management can be found in AFI 63-101 and AFPAM 63-128.

2.3.17. Document inspection and maintenance procedures in approved TOs. In the case of Commercial Off-the-Shelf (COTS) systems, commercial manuals may be used in place of TOs if appropriately numbered/labeled IAW TO policy.

2.3.18. Document processes to resolve nonstandard conditions IAW TO 00-25-107, *Maintenance Assistance*, TO 00-5-3, *Air Force Technical Order Life Cycle Management*, and AFMC Form 202, *Non-Conforming Technical Assistance Request/Reply*, per AFMCMAN 21-1, Chapter 5. Also document processes to resolve maintenance TO deficiencies or errors IAW TO 00-5-1, *AF Technical Order System.*

2.3.19. Establish a process for periodic evaluation of system's compliance with the requirements baseline and for evaluating system effectiveness and suitability in current threat environment, operational use, and maintenance support concepts.

2.3.20. For each program or project, identify and ensure protection of Critical Program Information (CPI). Develop a Program Protection Plan (PPP) and implement required countermeasures per DoDI 5200.39, *Critical Program Information Protection within the Department of Defense*, DoD 5200.1-M, *Acquisition Systems Protection Program*, AFPD 63/20-1, *Acquisition and Sustainment Life Cycle Management*, AFPAM 63-1701, *Program Protection Planning*, AFPD 63-17, *Technology and Acquisition Systems Security Program Protection*, and AFI 63-101.

2.3.20.1. Ensure an engineer is assigned to support the team focused on identifying and protecting CPI and DS&TI. These teams could include the technology protection working group, system security working group, working level integrated product team or other related program protection efforts.

2.3.21. Develop, maintain and control the system’s DoDAF views throughout the system’s life cycle, as appropriate.

2.3.22. Develop and implement a plan to mitigate the impacts of Diminishing Manufacturing Sources/Material Shortages in accordance with AFMCI 23-103, *Diminishing Manufacturing Sources and Materiel Shortages*.

2.3.23. Document contractor and government organization technical roles and responsibilities for a research, development, acquisition, test or sustainment program. This can be through contractual vehicles, Memorandum of Agreement (MOA), Memorandum of Understanding (MOU) or other agreements.

2.3.24. Develop and implement plans for developing and managing requirements. Identify and document user requirements; statutory, regulatory, and certification requirements; system assurance requirements; and other applicable standards prior to initiating any contractual action. Identify, develop mitigation plans for, and advocate funding for technical shortfalls, especially those caused by changing requirements.

2.3.25. When appropriate, ensure system airworthiness and follow AF policy regarding airworthiness assessment and issue appropriate Airworthiness Certificates or Airworthiness Releases. This is required in all cases regardless if a military airworthiness certificate is desired, if the Federal Aviation Administration airworthiness process is used to form the certification bases, or if the Special Operational Airworthiness Release (SOAR) process is being used to support issuance of an airworthiness release. For a

military airworthiness certification, MIL-HDBK-516, *Airworthiness Certification*, criteria shall be used to establish the certification basis, for the latest version contact the Airworthiness Center of Excellence (ASC/EN). Information concerning the SOAR process can be obtained from ASC/EN as well. Implement an airworthiness assessment process IAW AFPD 62-6, *USAF Aircraft Airworthiness Certification*.

2.3.26. Develop and implement an approach to continually assess, maintain, or improve a system's reliability, availability, maintainability and supportability.

2.3.27. Establish inspection intervals based on a quantitative assessment of system, sub-system, end item and component failures modes and criticalities using available design, test and failure history data, and Failure Modes, Effects, and Criticality Analysis (FMECA).

2.3.27.1. If a FMECA is not available, then it shall (as a minimum) be developed and expanded for that system incrementally as a compilation of FMECAs for each successive modification or major engineering problem investigation.

2.3.28. Establish a Weapon System Integrity Program IAW AFPD 63-1, *Acquisition and Sustainment Life Cycle Management*, MIL-HDBK 515, *Weapon System Integrity Guide (WSIG)*, MIL-STD-1530, *Aircraft Structural Integrity Program (ASIP)*, MIL-STD-3024, *Propulsion System Integrity Program (PSIP)*, MIL-STD-1798, *Mechanical Equipment and Subsystems Integrity Program*, and Avionics/Electronics Integrity (using current Air Force integrity program policy and guidance) as applicable.

2.3.29. Conduct and document technical assessments required to meet all user requirements; statutory, regulatory, and certification requirements; system assurance requirements; and other applicable standards.

2.3.30. Apply a documented process to conduct performance reviews of supply, maintenance, and repair in accordance with AFMCI 21-133, *Depot Maintenance Management for Aircraft Repair*.

2.3.31. Ensure government controlled system, sub-system and end item specifications are prepared IAW MIL-STD-961, *Defense Specifications*.

2.3.32. Integrate Environment, Safety, and Occupational Health (ESOH) into the LCSE and OSS&E processes using the most current version of MIL-STD-882, AFI 63-1201, AFI 91-202, *The US Air Force Mishap Prevention Program*, and DoDI 5000.02. Adequate ESOH experts should be involved throughout the lifecycle of the system.

2.3.33. Ensure that AFSIL correctly lists the system or end-item under the appropriate Product Line, and ensure that the information provided in AFSIL on the system or end-item is complete and current.

2.3.34. Implement the Defense Contract Management Agency (DCMA) Materiel Review Board (MRB) disposition authority process described in **Attachment 5**. Proper justification must be provided if authority cannot be granted.

2.3.35. Use M&S to augment and support design, development and test where appropriate.

2.3.36. Consider SoS/FoS and enterprise impacts when designing or updating the system, sub-system, or end item.

2.3.37. Facilitate continuous process improvement by periodically reviewing process compliance and effectiveness.

2.4. Chief Engineers shall:

2.4.1. Conduct structured technical reviews with clear entrance and exit criteria and agendas.

2.4.2. Develop and track metrics necessary to gauge key Technical Performance Measurements (TPMs), OSS&E, and overall health of the project or program and provide recommended actions to the SPM.

2.4.3. Put processes and agreements in place to ensure system, sub-system, or end item configuration is monitored and controlled. Report any unauthorized changes that violate the CM process to the SPM.

2.4.4. Ensure personnel assigned to perform SE duties receive SE training commensurate with their responsibilities for SE, system security, and OSS&E/mission assurance.

2.5. Lead Engineers in an organization outside of the supported CE shall document processes for managing system, sub-system, or end item interfaces and coordinate these processes with supported CEs.

2.6. The DSM is normally located at a Product Center. The DSM shall:

2.6.1. Maintain responsibility for acquisition activities for a system, sub-system, or end item beyond Milestone C.

2.6.2. Document and deliver products that meet OSS&E requirements defined by a SPM for the assigned system, sub-system, or end item.

2.6.3. Support an SPM located at an ALC.

2.6.4. Remain accountable to the SPM for OSS&E.

2.7. The SSM is normally located at an ALC. The SSM shall:

2.7.1. Accomplish sustainment responsibilities delegated by the SPM.

2.7.2. Document, maintain, and deliver products that meet the OSS&E requirements defined by the SPM for an assigned system, sub-system, or end item.

2.7.3. Remain accountable to the SPM for OSS&E.

2.8. The PGM shall:

2.8.1. Be the designated individual for overall management of a specified product group.

2.8.2. Execute cost, schedule, and performance aspects along with sustainment elements of a group’s products, e.g., landing gear or secondary power subsystems.

2.8.3. Document and deliver products that meet OSS&E requirements defined by a SPM for the assigned system, sub-system, or end item.

2.8.4. Coordinate product changes with the SPM as required to maintain system-level OSS&E.

2.9. The SCM shall:

2.9.1. Manage supply chain process and availability of commodities materiel based on supply and demand principles.

2.9.2. Receive and manage funding for sustainment of fielded assets, including funds for repairs, buys, and re-engineering of obsolete or unsustainable items.

2.9.3. Document and deliver products that meet OSS&E requirements defined by a SPM for an assigned system, sub-system, or end item.

2.9.4. Coordinate product changes with the SPM as required to maintain system-level OSS&E.

2.10. In addition to the requirements in **paragraph 2.2**, each Test Center-level Technical Authority shall:

2.10.1. Document standard SE processes per **paragraph 1.6.1**. in a Test Center organizational SE OI(s), and implement standard SE processes for Test and Evaluation Improvement and Modernization efforts.

2.10.1.1. Each organizational SE OI shall identify all subordinate organizations and programs to which it applies.

2.10.1.2. Organizational SE OIs shall be reviewed annually and updated as required by the Center-level Technical Authority.

2.10.1.3. SEPs for I&M efforts may be tailored based on the nature and scope of the effort. SEP preparation guidance should be used as the template to document SE and technical planning for I&M efforts. SE documentation may be aggregated as appropriate at the organizational level.

2.10.1.4. An OBD is not required for I&M efforts.

2.10.2. Ensure safety and integrity of all test events IAW AFMCI 99-103.

2.10.3. Test only configurations approved for test using approved Test Plans and Procedures IAW AFMCI 99-103.

2.10.4. Establish and maintain a configuration baseline for all equipment used during the execution of a formal test event using approved Test Plans and Procedures IAW AFMCI 99-103.

2.10.5. Ensure I&M Project Managers accomplish the program protection process and protect their project's CPI. The I&M project manager will implement protective countermeasures per the existing PPP, if CPI has been inherited or previously identified. If CPI has not been inherited or previously identified, the I&M project manager will evaluate the project for CPI. If CPI is identified, the I&M project manager will develop a PPP. I&M project managers may tailor project PPPs based on the breadth and scope of the project. Reference DoDI 5200.39, DoD 5200.1-M, AFPD 63-1, AFPD 63-17, AFI 63-101, and AFPAM 63-1701 for further guidance on the program protection planning process and CPI.

2.10.6. This policy applies to all I&M new start efforts. Current I&M programs will have one year from issuance to comply. A waiver request may be submitted to AFMC/A3 for current I&M programs if within two years of issuance the program will reach completion.

2.11. In addition to the requirements in **paragraph 2.2**., the AFRL Technical Engineering Authority shall:

2.11.1. Document standard SE processes appropriate to the maturity of the technology under development per **paragraph 1.6.1**, in an AFRL organizational SE OI or Supplement, and implement standard SE processes in science and technology programs.

2.11.1.1. The AFRL SE OI or Supplement shall identify all subordinate organizations to which it applies. The AFRL SE OI is not required to identify all programs to which it applies as stated in **paragraph 2.2.5.2** above.

2.11.1.2. Organizational SE OIs shall be reviewed annually and updated as required by the AFRL Technical Engineering Authority.

2.11.1.3. AFRL Science and Technology (S&T) research and development efforts, including AFRL-led basic research, applied research, and advanced research, shall follow this guidance.

2.11.1.4. AFRL S&T research and development efforts, including AFRL-led basic research, applied research, and advanced research, do not require a SEP.

2.11.1.5. AFRL shall document and archive trade study results for use in future technology demonstration or acquisition programs.

2.11.1.6. A documented applied and advanced research SE approach should explain how enterprise-wide integration strategies (e.g., as reflected in product center strategic technical plans) for likely "target" environments will guide architecture and implementation decisions.

2.11.2. Accomplish technology transition planning in collaboration with a transition and/or acquisition agent, IAW AFMCI 61-102, *Advanced Technology Demonstration Technology Transition Planning*.

2.11.3. Coordinate with SPM(s) on ATD, ACTD, JCTD, or other technology development program intended to modify one or more existing systems, sub-systems, or end items.

2.11.4. Ensure OSS&E baseline definition and certification requirements are integrated into a developer's design and development activity, using MIL-HDBK-514 as a guide. ATD, ACTD, JCTD, or other technology development program intended to transition to operational use, either as a modification to an existing system, sub-system, end item, or as a new system, sub-system or end item must ensure that the OSS&E baseline definition and certification requirements are coordinated with the system's (or enterprise) technical architecture.

2.11.5. Recognize the system, sub-system, or end-item S&T PM as the designated individual with responsibility and oversight over an AFRL led ATD, ACTD, JCTD, or other technology development program targeted for integration onto an existing system,

sub-system, or end item. The SPMs retain overall SE responsibility for a supported system, sub-system, or end item.

2.11.6. Ensure any ATD, ACTD, JCTD, or other technology development program is not connected (physically or through information networks) to any fielded system, sub-system or end item without CCB approval by the affected system, sub-system, or end item and implementation of OSS&E requirements, or using MAJCOM/A3 (or CC/CV) waiver of these SE processes.

2.11.7. Conduct structured technical reviews (lab management review, program baseline review, or equivalent).

2.11.8. Ensure any ATD, ACTD, JCTD, or other technology development program prepares a PPP and implements required countermeasures per DoDI 5200.39, DoD 5200.1-M, AFPD 63/20-1,AFPD 63-17, AFPAM 63-1701, and AFI 63-101. Identify CPI and ensure protection of DS&TI.

3. Adopted Forms:

AFMC Form 202, *Non-Conforming Technical Assistance Request/Reply*

AFMC Form 518, *Configuration Control Board Directive*

David C. Bond, SES
Director, Engineering and Technical Management

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

AFI 63-101, *Acquisition and Sustainment Life Cycle Management*, 17 April 2009

AFI 63-103, *Joint Air Force-National Nuclear Security Administration (AF-NNSA) Nuclear Weapons Acquisition*, 24 September 2008

AFI 63-501, *Air Force Acquisition Quality Program*, 31 May 1994

AFI 63-1101, *Modification Management*, 17 July 2001

AFI 63-1201, *Life Cycle Systems Engineering*, 23 July 2007

AFI 91-202, *The US Air Force Mishap Prevention Program*, 1 August 1998

AFMAN 33-363, *Management of Records*, 1 March 2008

AFPD 16-10, *Modeling and Simulation*, 10 March 2006

AFPD 20-1, *Acquisition and Sustainment Life Cycle Management*, 3 April 2009

AFPD 62-6, *USAF Aircraft Airworthiness Certification*, 1 October 2000

AFPD 63-1, *Acquisition and Sustainment Life Cycle Management*, 3 April 2009

AFPD 63-17, *Technology and Acquisition Systems Security Program Protection*, 26 November 2001

AFPAM 63-1701, *Program Protection Planning*, 27 March 2003

AFMCI 21-133, *Depot Maintenance Management for Aircraft Repair*, 24 March 2005

AFMCI 23-103, *Diminishing Manufacturing Sources and Materiel Shortages (DMSMS) Program*, 13 October 2000

AFMCI 61-102, *Advanced Technology Demonstration Technology Transition Planning*, 30 May 2006

AFMCI 63-501, *AFMC Quality Assurance*, 14 December 2001

AFMCI 99-103, *Test Management*, 22 November 2004

DoDD 5000.01, *The Defense Acquisition System*, 12 May 2003

DoDI 5000.02 *Operation of the Defense Acquisition System*, 8 December 2008

DoDI 5200.39, *Critical Program Information Protection within the Department of Defense*, 16 July 2008

DoD 5200.1-M, *Acquisition Systems Protection Program*, 16 March 1994

MIL-HDBK-61A, *Configuration Management Guidance*, 7 February 2001

MIL-HDBK-514, *Operational Safety, Suitability, and Effectiveness for the Aeronautical Enterprise*, 4 January 2008

MIL-HDBK 515, *Weapon System Integrity Guide (WSIG*), 29 June 2007

MIL-HDBK-516, *Airworthiness Certification*, 29 February 2008

MIL-STD-882, *Standard Practice for System Safety*, 10 February 2000

MIL-HDBK-896, *Manufacturing and Quality Program*, and ASC *Manufacturing Development Guide*, 8 August 2008

MIL-STD-1530, *Aircraft Structural Integrity Program (ASIP)*, 1 November 2005

MIL-STD-1798, *Mechanical Equipment and Subsystems Integrity Program*, 15 April 2008

MIL-STD-3024, *Propulsion System Integrity Program (PSIP)*, 15 April 2008

TO 00-5-1, *AF Technical Order System*, 1 October 2008

TO 00-5-3, *Air Force Technical Order Life Cycle Management*, 1 November 2008

TO 00-35D-54, *USAF Deficiency Reporting and Investigation System*, 1 May 2007

Abbreviations and Acronyms

ACAT—Acquisition Category

ACTD—Advanced Concept Technology Demonstration

AF—Air Force

AFI—Air Force Instruction

AFMAN—Air Force Manual

AFMC—Air Force Materiel Command

AFMCI—Air Force Materiel Command Instruction

AFPD— Air Force Policy Directive

AFRL—Air Force Research Laboratory

AFROC—Air Force Requirements Oversight Council

ALC—Air Logistics Center

AoA—Analysis of Alternatives

ATD—Advanced Technology Demonstration

CAGE—Commercial and Government Entity

CCA—Configuration Control Authority

CCB—Configuration Control Board

CCTD—Concept Characterization and Technical Description

CDCA—Current Document Change Authority

CE—Chief Engineer

CM—Configuration Management

COTS—Commercial Off-the-Shelf

CPI—Critical Program Information

CTE—Critical Technology Element

DAO—Designated Acquisition Official

DCMA—Defense Contract Management Agency

DLA—Defense Logistics Agency

DoD—Department of Defense

DoDAF—DoD Architecture Framework

DoDI—Department of Defense Instruction

DS&TI—Defense Science and Technology Information

DSM—Development Support Manager

ESOH—Environment, Safety and Occupational Health

FA&A—Functional Analysis and Allocation

FMECA—Failure Modes, Effects, and Criticality Analysis

FoS—Family of Systems

GFE—Government Furnished Equipment

HSI—Human Systems Integration

IAW—In Accordance With

ISR—Intelligence, Surveillance & Reconnaissance

ITT—Integrated Test Team

JCTD—Joint Capability Technology Demonstration

KPP—Key Performance Parameter

KSA—Key System Attribute

LCMP—Life Cycle Management Plan

LCSE—Life Cycle Systems Engineering

LE—Lead Engineer

LSSP—Life-Cycle Signature Support Plan

M&S—Modeling & Simulation

MAJCOM—Major Command

MOA—Memorandum of Agreement

MOU—Memorandum of Understanding

MRB—Materiel Review Board

OBD—OSS&E Baseline Document

OSS&E—Operational Safety, Suitability, and Effectiveness

PEO—Program Executive Officer

PGM—Product Group Manager

PPP—Program Protection Plan

PQDR—Product Quality Deficiency Report

PSE—Peculiar Support Equipment

S&T—Science and Technology

SAP/SAR—Special Access Programs/Special Access Required

SCM—Supply Chain Manager

SE—Systems Engineering

SEP—Systems Engineering Plan

SOAR—Special Operational Airworthiness Release

SoS—System-of-systems

SPM—System Program Manager

SSM—System Support Manager

T&E—Test and Evaluation

TO—Technical Order

TPM—Technical Performance Measurement

V&V—Verification and Validation

WSPCE—Weapon System Platform Chief Engineer

Terms and Definitions

Center—level Technical Authority—A designated SE Technical Authority at each Product, Test, and Logistic Center is responsible to the PEO/DAO or the Center Commander/Director for a portfolio approach to SE implementation, across all technical efforts and programs regardless of ACAT or life cycle phase.

Chief Engineer—The System Program Manager's chief technical authority responsible for implementing the program's OSS&E and systems engineering technical processes.

Commodity—A group or range of items which possess similar characteristics, have similar applications, or are susceptible to similar supply management methods.

End item—Equipment that can be used by itself to perform a military function. The final production product, assembled or completed, and ready for issue/deployment.

Improvement & Modernization (I&M) Programs—Programs covered under the T&E Investment Planning and Programming (TIPP) process managed by AFMC/A3F with active participation by HQ USAF/TER, MRTFB representatives and HQ AFMC Product Centers. The

TIPP process identifies and prioritizes projects funded by the Major T&E investment (PE 0604759F) and Threat Systems Development Programs (PE 0604256F).

Integrity Program—The process to track assets and usage, assess inspection and maintenance records, factor in write-ups, deficiency reports, and mishap data, and to schedule inspections and maintenance based on design and operational experience.

Life Cycle Management Plan—The integrated acquisition and sustainment strategy for the life of the system. Streamlines, consolidates, and makes visible to senior leadership all aspects of the program. Fulfills the FAR, DFARS, and AFFARS requirements of the Acquisition Plan and the DoDI 5000.02 requirements of the Acquisition Strategy which includes the Life Cycle Sustainment Plan.

Lead Engineer—Supports the Chief Engineer with responsibility for implementing systems engineering technical processes for commodities, sub-systems, or end items. Responsible for implementing OSS&E and systems engineering technical processes for sub-systems or end items.

Operational Effectiveness—The overall degree of mission accomplishment of a system or end item used by representative personnel in the environment planned or expected for operational employment of the system or end item which considers organization, doctrine, tactics, survivability, vulnerability and threat.

Operational Safety—The condition of having acceptable risk caused by a system, end item, or subsystem when employing that system, end item, or subsystem in an operational environment. This requires the identification of hazards, assessment of risk, determination of mitigating measures, and acceptance of residual risk.

Operational Suitability—The degree to which a system or end item can be placed satisfactorily in field use, with consideration given to availability, compatibility, transportability, interoperability, reliability, safety, human factors, documentation and training requirements among others.

OSS&E Baseline Document—Describes the collection of information that provides the essential characteristics and information that must be known to safely and effectively operate, upgrade, maintain and sustain a specific system or end item. Generally it references the location of other documents that support the OBD.

Product Group—A set of products that use similar or same production processes, have similar physical characteristics, or share customer segments, distribution channels, pricing methods, etc.

Systems Engineering Plan—A living document in which periodic updates capture the program's current status and evolving SE implementation and its relationship with the overall program management effort.

Subsystem—A functional grouping of components that combine to perform a major function within an element such as electrical power, attitude control, and propulsion.

Supply Chain Management—Strategy for integrated life cycle management enterprise sustainment that integrates acquisition of assets, supply, maintenance, and distribution functions with the physical, financial, information, and communications networks in a results-oriented approach to satisfy materiel requirements.

System—A specific grouping of subsystems, commodities and/or components designed and integrated to perform a military function.

Transfer Support Plan—All system/program transfers shall be conducted in accordance with this document. It is prepared by the losing PM in collaboration with their counterparts at the gaining organization. It will be maintained until the program transfer is completed, or a determination is made to terminate the proposed program transfer.

NOTE: For additional terms and definitions not provided here see Joint Publication (JP) 1—02, Department of Defense Dictionary of Military and Associated Terms, and Air Force Doctrine Document (AFDD) 1-2, Air Force Glossary, which contain standardized terms and definitions for DoD and Air Force use.

Attachment 2

SYSTEMS ENGINEERING LIFE CYCLE PROCESSES

A2.1. This attachment provides an overview of the systems engineering life cycle processes described in the *Air Force Systems Engineering Assessment Model (AF SEAM)Management Guide*. Refer to the guide for additional details on these processes. The minimum requirements and required artifacts listed in this attachment are applicable to Science and Technology research efforts once they are tailored to match the maturity of the research. Configuration Management

A2.1.1. The Configuration Management process is utilized to establish and maintain the integrity of the product's technical baseline while accommodating change. A baseline is defined as a set of specifications or work products that has been formally reviewed and agreed on, that thereafter serves as the basis for further development and authoritative representation of the product. An example of a baseline is an approved description of a product that includes internally consistent versions of requirements, requirement traceability matrices, designs, end-user and support documentation, etc.

A2.1.2. A progression of technical baselines is developed during the development life cycle of a product. Baselines provide a stable basis for continuing evolution of configuration items, which are defined as aggregations of work products that are designated for configuration management and are treated as single entities within the configuration management process. Once the baseline is established, changes to the configuration items can only be done through a formal change process.

A2.1.3. Minimum requirements:

A2.1.3.1. Document the configuration management process

A2.1.3.2. Establish a configuration control board

A2.1.3.3. Identify the configuration items

A2.1.3.4. Establish and maintain the technical baseline

A2.1.3.5. Document changes to the configuration items

A2.1.3.6. Perform configuration audits

A2.1.4. Required artifacts:

A2.1.4.1. Configuration Management Plan

A2.1.4.2. Configuration Control Board Charter

A2.1.4.3. List of configuration items

A2.1.4.4. Baseline description (e.g., functional, allocated, product)

A2.1.4.5. Change requests

A2.1.4.6. Configuration audit results

A2.2. Decision Analysis.

A2.2.1. The Decision Analysis process is used to consider possible decisions using a formal process that evaluates identified alternatives against established criteria. It is often a multi-

disciplined activity requiring considerations of costs, schedules, risks, sustainment impacts, and other factors. A repeatable, criteria-based decision making process is especially important, both while making the critical decisions that define and guide the acquisition process itself and later when critical decisions are made with the selected suppliers. The establishment of a formal process for decision making provides the acquisition project with documentation of the decision rationale. Such documentation allows the criteria for critical decisions to be revisited when changes that impact project requirements or other critical project parameters change.

A2.2.2. Minimum requirements:

A2.2.2.1. Document the decision analysis methodology

A2.2.2.2. Determine when an issue needs to follow the formal evaluation process (e.g., based on a cost threshold)

A2.2.2.3. Identify alternative solutions that should be considered

A2.2.2.4. Evaluate the alternatives and document the decision (e.g., evaluation criteria, rationale for selecting the alternative)

A2.2.3. Required artifacts:

A2.2.3.1. Decision analysis methodology

A2.2.3.2. Criteria for evaluating alternatives

A2.2.3.3. AoA/decision analysis report

A2.3. Design.

A2.3.1. The Design process involves conceiving and proofing an integrated solution that satisfies product requirements. The Design process area focuses on product design, initial implementation, and integration. As each level of the product is defined, there is an iterative process of allocation, high-level design, and requirements definition (for the next lower level).

A2.3.2. Product design consists of two broad phases that may overlap in execution: preliminary and detailed design. Preliminary design establishes product capabilities and the product architecture, including product partitions, product-component identifications, product states and modes, major inter-component interfaces, and external product interfaces. Detailed design fully defines the structure and capabilities of the product components. During detailed design, the product architecture details are finalized and product components and interfaces are completely defined.

A2.3.3. Product integration is achieved through progressive assembly of product components, in one stage or in incremental stages, according to a defined integration sequence and procedures. A critical aspect of product integration is the management of interfaces to the products and between product components to ensure compatibility among the interfaces. Attention should be paid to interface management throughout the project.

A2.3.4. Product integration can be conducted incrementally, using an iterative process of assembling product components, evaluating them, and then assembling larger collections of components. This process may begin with analysis and simulations (e.g., virtual and rapid

prototypes). In a succession of builds, the simulated product is constructed, evaluated, improved, and reconstructed based upon knowledge gained in the evaluation process.

A2.3.5. Minimum requirements:

A2.3.5.1. Develop design documentation (e.g., DoDAF views, interface design documents)

A2.3.5.2. Develop initial designs for each component, end item, system, etc. based on identified requirements and constraints (consider purchasing COTS products and as well as developing new ones)

A2.3.5.3. Evaluate any design alternatives based on established selection criteria (use M&S and prototyping as required)

A2.3.5.4. Develop detailed designs for components, end items, systems, etc.

A2.3.5.5. Conduct technical reviews based on entrance and exit criteria

A2.3.5.6. Prepare a technical data package

A2.3.6. Required artifacts:

A2.3.6.1. Design criteria (e.g., Key Performance Parameter (KPPs), interfaces, statutory requirements)

A2.3.6.2. Design documents (e.g., DoDAF views, engineering drawings, use cases, interface control documents, BOMs)

A2.3.6.3. Documented baseline (e.g., functional, allocated)

A2.3.6.4. Associated technical review (e.g., PDR, CDR) entrance and exit criteria

A2.3.6.5. Trade studies/analyses

A2.3.6.6. Technical data package

A2.4. Manufacturing.

A2.4.1. The Manufacturing process is used to prepare for and produce the required product and includes the following: 1) application of industrial base and manufacturing process expertise and information to the Requirements and Design processes, 2) planning for and managing the manufacturing process maturation efforts needed for successful transition from product development to rate production, and 3) stabilizing a sustained rate production while assuring affordable quality products.

A2.4.2. Clear manufacturing readiness criteria should exist for each phase of the project and be agreed to by relevant stakeholders. Manufacturing readiness assessments should be conducted to confirm manufacturing readiness at key points in the project. Manufacturing transition plans are established to address the manufacturing readiness criteria and executed to ensure maturation of manufacturing capability. The residuals of manufacturing (e.g., facilities, processes, tooling, and test equipment) should be integrated into the support infrastructure required for the remainder of the product life cycle.

A2.4.3. Minimum requirements:

A2.4.3.1. Ensure strategic manufacturing planning and integration with design

A2.4.3.2. Define critical manufacturing processes and key characteristics

A2.4.3.3. Ensure readiness for transition to production

A2.4.3.4. Establish and maintain a supplier management program

A2.4.3.5. Create and maintain a quality management system

A2.4.3.6. Develop a system to ensure process control and variability reduction

A2.4.3.7. Establish a process/culture to facilitate continuous improvement throughout the supply chain

A2.4.4. Required artifacts:

A2.4.4.1. Manufacturing Plan with assigned roles and responsibilities of the program office, contractor, suppliers, DCMA, etc.

A2.4.4.2. Key characteristics, processes, and metrics

A2.4.4.3. Production Readiness Review

A2.4.4.4. Supplier management plan

A2.4.4.5. Quality Assurance Plan and deficiency reporting system

A2.4.4.6. Metrics, root cause analyses, value stream maps

A2.5. Project Planning.

A2.5.1. Project Planning is a multi-disciplined process used to establish and maintain plans that define project activities. Planning starts by aligning the technical activities with the acquisition strategy and is followed by planning technical activities in ever increasing levels of detail. The resulting plans should be reviewed for consistency with the overall acquisition plan. The acquirer's and suppliers' project planning processes are continuous, and the plans evolve to meet the project's needs.

A2.5.2. Project planning relates the acquisition's technical objectives, constraints, availability of assets and technologies, accommodation of end user considerations, consideration of risk, and technical support for the project over the life cycle.

A2.5.3. Minimum requirements:

A2.5.3.1. Develop and document project/technical plans that consider the entire life cycle

A2.5.3.2. Prepare a work breakdown structure to manage the project

A2.5.3.3. Determine the scope of the project's work products and tasks

A2.5.3.4. Develop and update cost and schedule estimates

A2.5.3.5. Develop entrance and exit criteria for technical reviews, milestones, key decision points, etc.

A2.5.3.6. Review plans to ensure they are integrated and consistent (update as necessary)

A2.5.4. Required artifacts:

A2.5.4.1. Planning documents (e.g., Systems Engineering Plan, Project Management Plan, Integrated Master Plan, Integrated Master Schedule, Life Cycle Management Plan, Staffing Plan)

A2.5.4.2. Work breakdown structure (WBS)

A2.5.4.3. Work packages

A2.5.4.4. Funding documents and cost data

A2.5.4.5. Entrance and exit criteria for technical reviews, milestones, key decision points, etc.

A2.6. Requirements.

A2.6.1. The Requirements process is used to develop and analyze operational user, product, and product-component requirements to assure consistency between those requirements and the project's technical plans and work products and to manage requirements evolution through the life cycle of the product.

A2.6.2. The Requirements process has three contexts: 1) the amalgamation and coordination of the stakeholder requirements into a set of requirements that will define the scope and direction of the acquisition, 2) the logical analysis that discovers any natural partitioning manifested in the requirements, and 3) the extension of the customer requirements and additional acquirer requirements derived from design activities that occur as the product matures and evolves (e.g., product characteristics, architecture requirements, component design requirements).

A2.6.3. Developing increasingly detailed derived requirements is a continuous, iterative process that occurs as the multiple layers of a complex product are defined. For example, requirements flow from the stakeholders to the product, segment, etc., and eventually to hardware or software component levels. The responsibility for developing requirements down through the levels is generally split between the acquirer and the suppliers. The acquirer is generally responsible for the higher levels, starting with operational requirements, and the suppliers are generally responsible for lower levels. The division of responsibilities between the acquirer and suppliers is determined for each project.

A2.6.4. The acquirer is responsible for defining and base lining the requirements levels under its control and also monitoring the suppliers' definition of the lower level requirements. The acquirer will provide direct management of acquirer-controlled requirements and oversight of suppliers' requirements management. Requirements should be managed and maintained with discipline so that changes are not executed without recognizing the impact to the project.

A2.6.5. Minimum requirements:

A2.6.5.1. Document the requirements management process

A2.6.5.2. Involve stakeholders when developing requirements

A2.6.5.3. Identify and document compulsory (e.g., statutory, regulatory, KPPs, interfaces) and derived requirements

A2.6.5.4. Prioritize the requirements

A2.6.5.5. Document and manage the requirements (avoid requirements creep)

A2.6.5.6. Ensure requirements have bidirectional traceability from the user need to the design solution

A2.6.5.7. Refine, elaborate, and allocate requirements during the Design process

A2.6.5.8. Analyze requirements throughout the product life cycle (e.g., to ensure they are necessary and sufficient, to balance stakeholder needs and constraints, to ensure the evolving product will perform as intended in the operational environment)

A2.6.5.9. Identify and resolve inconsistencies between requirements, project plans, and work products

A2.6.5.10. Conduct technical reviews (e.g., System Requirements Review) based on entrance and exit criteria

A2.6.6. Required artifacts:

A2.6.6.1. Requirements Management Plan

A2.6.6.2. User requirements documents (e.g., Initial Capabilities Document, Capabilities Development Document, Concept of Operations)

A2.6.6.3. System/Technical Requirements Document or Performance Specification

A2.6.6.4. Requirements traceability matrix/requirements correlation matrix or table

A2.6.6.5. Requirements/functional baseline

A2.6.6.6. Technical review documentation (e.g., entrance and exit criteria, meeting minutes, action items)

A2.7. Risk Management.

A2.7.1. The Risk Management process is used to identify potential problems before they occur so risk handling activities may be planned and invoked as needed to handle adverse impacts on achieving objectives.

A2.7.2. Risk identification and estimation of probability of occurrence and impact, particularly for those risks involved in meeting performance requirements, schedules, and cost targets, largely determine the acquisition strategy. The acquirer has a dual role: 1) assessing and managing technical risks for the duration of the project, and 2) assessing and managing technical risks associated with the performance of the supplier. As the acquisition progresses to the selection of a supplier, the risk specific to the supplier's technical and management approach then becomes important to the success of the acquisition.

A2.7.3. Minimum requirements:

A2.7.3.1. Document the risk management approach (include risk sources and categories)

A2.7.3.2. Identify and document risks

A2.7.3.3. Assign a probability and consequence to each risk based on established criteria

A2.7.3.4. Prioritize risks based on their probability and consequence

A2.7.3.5. Aggregate interrelated risks

A2.7.3.6. Develop an appropriate risk handling method (assume, control/mitigate, avoid, transfer)

A2.7.3.7. Monitor and assess risk handling activities

A2.7.4. Required artifacts:

A2.7.4.1. Risk Management Plan

A2.7.4.2. Risk matrix with definitions for probability and consequence

A2.7.4.3. Risk review documentation

A2.7.4.4. Results of failure mode and effects analysis

A2.8. Sustainment.

A2.8.1. The Sustainment process is used to prepare for and execute the support, maintenance, repair, and disposal of a product while ensuring it is safe, suitable, and effective. Sustainment is the planning, programming, and executing of a support strategy. It includes specific activities in all phases of a product life cycle from product concept formulation to disposal.

A2.8.2. The overarching support concept should be considered from the start of any development or modification effort. Support concepts like condition based maintenance will drive requirements and design decisions. Early ALC representation in development of the support concept and related requirements is necessary to reduce total ownership costs.

A2.8.3. Minimum requirements:

A2.8.3.1. Identify/establish support activities

A2.8.3.2. Plan for necessary resources

A2.8.3.3. Plan for disposal

A2.8.3.4. Plan for required funding

A2.8.3.5. Establish list of qualified suppliers

A2.8.4. Required artifacts:

A2.8.4.1. Life Cycle Management Plan (or equivalent)

A2.8.4.2. Transfer Support Plan

A2.8.4.3. Technical orders

A2.8.4.4. Training manuals

A2.8.4.5. Technical data packages

A2.9. Technical Management and Control.

A2.9.1. The Technical Management and Control process is utilized to provide an understanding of the project's technical progress so that appropriate corrective actions can be taken when the project's performance deviates significantly from the plan. Corrective actions may require replanning, which may include revising the original plan, establishing new agreements, or including additional mitigation activities in the current plan. If a

corrective action is required to resolve variances from project plans, these actions should be defined and tracked to closure.

A2.9.2. A project's documented plan is the basis for monitoring activities, communicating status, and taking corrective action. Progress is primarily determined by comparing actual work product and task attributes, effort, cost, and schedule to the plan at prescribed milestones or control levels in the project schedule or WBS. Appropriate visibility of progress enables timely corrective action to be taken when performance deviates significantly from the plan. A deviation is significant if, when left unresolved, it precludes the project from meeting its objectives.

A2.9.3. Monitoring and control functions are established early in the project as the project's planning is performed and the acquisition strategy is defined. As the acquisition of technology solutions unfolds, monitoring and control activities are essential to ensure that appropriate resources are being applied and that acquirer activities are progressing according to plan.

A2.9.4. Minimum requirements:

A2.9.4.1. Document the approach to technical management and control

A2.9.4.2. Establish integrated product teams (IPTs)

A2.9.4.3. Develop a measurement approach (include measurement objectives and criteria)

A2.9.4.4. Monitor and control the project throughout its life cycle

A2.9.4.5. Plan and conduct technical reviews

A2.9.4.6. Manage work products and project data

A2.9.4.7. Monitor and manage corrective actions to closure (use a deficiency reporting system as appropriate)

A2.9.5. Required artifacts:

A2.9.5.1. Technical planning documents (e.g., SEP, LCMP)

A2.9.5.2. IPT charters

A2.9.5.3. Project metrics

A2.9.5.4. Status reports

A2.9.5.5. Technical review meeting minutes

A2.9.5.6. Corrective action plans/reports

A2.10. Verification and Validation.

A2.10.1. The Verification process ensures that work products meet their specified requirements, whereas the Validation process demonstrates that a product or product component fulfills its intended use when placed in its intended environment.

A2.10.2. It is important that the acquirer define at the outset the degree to which verification and validation are required both early in the definition of the project and later when the

products are received. Test and analysis techniques should be implemented as early as possible to identify deficiencies that require corrective action to meet system requirements.

A2.10.3. The acquirer should ensure that a proper verification environment exists, that it selects work products to evaluate based on documented criteria, and that the supplier uses appropriate methods to verify its work products. In this context, the test and evaluation community is a major stakeholder, and should participate in up-front planning through final product acceptance.

A2.10.4. Product verification activities are routinely conducted throughout the entire contract performance period, and results are analyzed to determine acceptability of the products. Validation activities are normally performed early and continuously throughout the acquisition life cycle. Product validation activities can be applied to all aspects of the product in any of its intended environments, such as operation, training, manufacturing, maintenance, and support services.

A2.10.5. Minimum requirements:

A2.10.5.1. Form an Integrated Test Team (ITT)

A2.10.5.2. Document an integrated approach for verification and validation (include methodology, procedures, criteria, required resources, etc.)

A2.10.5.3. Conduct peer reviews of selected work products

A2.10.5.4. Conduct verification and validation according to the plan

A2.10.5.5. Ensure any necessary certifications and accreditations are completed

A2.10.5.6. Document and analyze the results of the verification and validation activities

A2.10.5.7. Perform any necessary corrective actions

A2.10.6. Required artifacts:

A2.10.6.1. ITT Charter

A2.10.6.2. Test plan (e.g., Test and Evaluation Master Plan, Software Test Plan)

A2.10.6.3. Peer review findings and corrective actions

A2.10.6.4. Test reports

A2.10.6.5. Certification and accreditation approvals

A2.10.6.6. Corrective action plan

A2.10.6.7. Deficiency reports

Attachment 3

OSS&E

A3.1. Effective OSS&E is accomplished by preserving technical integrity through prudent use of disciplined SE practices, assurance of proper operation and maintenance, effective supply systems, and feedback on system utilization and maintenance trends to SE offices. MIL-HDBK-514, *Operational Safety, Suitability, and Effectiveness for the Aeronautical Enterprise*, should be used as a guide when establishing an OSS&E baseline.

A3.2. An OSS&E baseline is a:

A3.2.1. Complete set of requirements, including certification, statutory, and regulatory requirements,

A3.2.2. Descriptive configuration information, characteristics, and limitations of product(s) satisfying requirements,

A3.2.3. Hardware and/or software product(s) that satisfies the requirements and

A3.2.4. Support needed to ensure product(s) continue to meet the requirements throughout its life cycle

A3.3. The OSS&E baseline shall be documented in the OBD.

A3.3.1. The SPM is ultimately responsible for the preparation of the OBD, but it should be developed in coordination with the CE/LE and the Using Command.

A3.3.2. The SPM, CE/LE, and the Using Command shall all be signatories on the OBD.

A3.4. Milestones for development/update, verification, delivery, and maintenance of the OBD shall appear in the Integrated Master Plan, Integrated Master Schedule, or top-tier schedule.

A3.5. The OBD shall contain the following elements:

A3.5.1. System, sub-system, or end item identification,

A3.5.2. Configuration Description:

A3.5.2.1. Configuration baseline,

A3.5.2.2. Source documents for current operational requirements and

A3.5.2.3. System and allocated requirements and requirements traceability

A3.5.3. Safety:

A3.5.3.1. Critical safety items,

A3.5.3.2. All high/serious risks to life, health, property, or environment and

A3.5.3.3. Actions taken to mitigate high/serious risks

A3.5.4. Suitability:

A3.5.4.1. Identify or specifically reference significant suitability information needed including availability, compatibility, transportability, interoperability, reliability, wartime use rates, maintainability, human factors, architectural and infrastructure compliance,

manpower supportability, logistics supportability, natural environmental effects and impacts, and key documentation and training requirements,

A3.5.4.2. Approved categories of supply, maintenance, and repair,

A3.5.4.3. Availability of technical data required to qualify a new source of supply, maintenance or repair,

A3.5.4.4. Parts with restricted sources and

A3.5.4.5. Critical manufacturing processes.

A3.5.5. Effectiveness:

A3.5.5.1. Threats against which this system/end item is effective and ineffective,

A3.5.5.2. Reference sources for critical operational use, maintenance, or support required to maintain effectiveness,

A3.5.5.3. Identify intended KPPs, key systems attributes, and key limitations

A3.5.6. Certifications:

A3.5.6.1. All applicable certifications and date certified and

A3.5.6.2. Identify any applicable certifications waived and cite waiver document

A3.5.7. Quality Assurance – standards for both hardware and software,

A3.5.8. Technical Data – cite necessary technical data by document number,

A3.5.9. Limitations, Deviations, Waivers, or Variances – list or describe by specific reference all important limitations (safe, effective, or suitable operating limits), any known combined conditions or usages requiring caution, any certification waivers, or variances. Identify any known deficiencies not described elsewhere in the baseline, and

A3.5.10. OSS&E Metrics:

A3.5.10.1. Coordinate with the lead using Command a set of key parameters most indicative of the OSS&E health of the system/end item.

A3.5.10.2. OSS&E metrics need to be defined and agreed-to prior to production, and collected and reported after fielding.

A3.5.10.3. At least one parameter must be a measure of system/end item reliability.

A3.5.10.4. At least one parameter must be a measure of system/end item operational availability.

A3.5.10.5. At least one parameter must be a measure of system/end item safety.

A3.5.10.6. At least one parameter must be a measure of system/end item suitability.

A3.5.10.7. At least one parameter must be a measure of system/end item effectiveness.

A3.5.11. Consider the use of predictive, forward-looking metrics to provide actionable data for system/end-item leadership.

Attachment 4

SEP REQUIREMENTS

A4.1. The SEP shall describe the technical approach utilized to manage the program throughout the life cycle.

A4.2. The SEP shall describe processes for collecting data, evaluating and reporting TPMs.

A4.3. Per AFI 63-1201 and consistent with AFI 63-1101 paragraph 1. 2.3, SEPs are not required for programs scheduled for final decommissioning within five years of the date of this AFI.

A4.4. Programs with a SEP in place are exempt from annual reviews/updates within five years of scheduled final decommissioning; however, execution of SEP efforts shall continue through decommissioning.

A4.5. A description of how each of the following elements will be integrated into an overall Systems Engineering process: technology development, product design, manufacturing, integration, system safety, verification, validation, fielding, support, sustainment and disposal.

A4.6. In addition to published DoD and Air Force level guidance, a SEP and/or LCMP shall contain the following information as appropriate:

A4.6.1. SPM's process verification methodology,

A4.6.2. Existing or planned MOAs, MOUs, contractual arrangements or other agreements,

A4.6.3. Identification of applicable mission and operational capability manager(s),

A4.6.4. Resource requirements necessary to create and maintain the OSS&E baseline,

A4.6.5. A description of how OSS&E life cycle processes will be implemented, executed and verified IAW MIL-HDBK-514, *Operational Safety, Suitability, and Effectiveness for the Aeronautical Enterprise*,

A4.6.6. Technical resources required to execute the product support strategy,

A4.6.7. Technical risks that have been accepted at levels above the SPM

A4.6.8. Any modernization or modification efforts

A4.6.9. SPM's plan for conducting and documenting trade studies,

A4.6.10. Test facility or instrumentation updates, and

A4.6.11. Transfer Support Plan.

A4.7. ACAT modernization or modification efforts may be documented as attachments to a system, sub-system, or end item SEP. Families of similar products or FoS may be documented in a single combined SEP.

A4.8. For systems, sub-systems, or end items in sustainment, the SPM shall tailor SEP content requirements if historical information is not available.

A4.8.1. Any content waived for this reason shall have a brief statement stating that information was not available.

A4.9. A SEP can reference any other program plans, processes or documents rather than duplicate the same information.

A4.10. Except for OSD oversight programs, SEP requirements can be included in the organizational SE OIs and/or Life Cycle Management Plan, unless the program execution chain requires a separate document.

A4.11. If a program has an approved SEP consistent with organizational SE OIs, it may be inserted into the LCMP without removing the processes covered in the organizational SE OIs; programs are not required to modify approved SEPs until significant updates are required IAW DoDI 5000.02.

A4.12. ACAT I SEPs require SAF/AQR approval.

A4.13. If an organizational SE OI does not meet SAF/AQR requirements for a program or project SEP approval, required content changes will be included in the program or project SEP or LCMP.

A4.14. Traditional program SEPs, required for OSD oversight programs, will continue to be reviewed using existing checklists and processes.

A4.15. The Center EN shall coordinate on all SEPs for programs managed at that Center prior to submittal to the PEO/DAO or Center Commander. For multi-center programs (e.g., the program PEO/DAO is located at a different Center) and joint programs, the Center EN supporting the program's PEO/DAO shall determine the Center-level technical coordination requirements and document them in an MOU with the supporting Center(s).

A4.16. Centers shall maintain electronic copies of approved SEPs.

A4.17. Additional SEP guidance can be found in the DoD *Systems Engineering Plan Preparation Guide.*

Attachment 5

DELEGATION OF CLASS II ENGINEERING CHANGE PROPOSAL (ECP) AND MINOR NONCONFORMANCE DISPOSITION AUTHORITY TO DEFENSE CONTRACT MANAGEMENT AGENCY (DCMA) FOR AVIATION CRITICAL SAFETY ITEMS (CSIS)

A5.1. This attachment provides a description of the process for the delegation of Class II ECP and minor nonconformance disposition authority to DCMA for aviation CSIs. The attachment also establishes that if another service has determined delegation of disposition authority is appropriate, AFMC will accept the MRB disposition authority delegation decision unless proper justification is provided for denying that authority. Proper justification may include existing contractual requirement for CSI identification, schedule impact, cost effectiveness, and resource availability. This guidance only applies to Class II ECP and minor non-conformances for aviation CSIs.

A5.2. MRB Disposition Authorization Process (See Figure A5. 1.)

A5.2.1. Critical Safety Item (CSI) identification process

A5.2.1.1. Process outlined within CSI Joint Policy and the JALC CSI Handbook

A5.2.1.2. Encompass identification of CSIs by each Weapon System Platform Chief Engineer (WSPCE)

A5.2.1.2.1. Identification of item's critical characteristics – Depot, Installation, Manufacturing

A5.2.1.2.2. Identification of approved source of supply

A5.2.1.2.3. Update of tech data

A5.2.1.3. Out of this process each weapon system will have a list of CSIs which is the input for the next process.

A5.2.1.3.1. AF CSIs identified within the AF CSI Community of Practice

A5.2.2. A request for (MRB or Class II ECP) delegation may originate from DLA, a vendor, and/or the AF or Service procuring activity

A5.2.3. Identify sources of supply under consideration for delegation authority

A5.2.3.1. DLA/compile list of AF CSI Primes and OEMs by weapons system

A5.2.3.2. HQ AFMC/A4UE, on behalf of HQ AFMC/EN, annotates which vendors already have Navy and Army approved MRB & Class II ECP delegation authority for aviation CSIs

A5.2.3.3. HQ AFMC/A4UE distribute list to Centers for delegation determination review

A5.2.3.4. Center ENs distribute lists to WSPCEs

A5.2.4. Approved source

A5.2.4.1. The affected WSPCE will verify if the request for authority to disposition Class II ECP or minor nonconformance for aviation CSIs involves an already approved source (Prime or Original Equipment Manufacturer (OEM))

A5.2.4.2. If the source is not within the approved list, the WSPCE will evaluate possibility of adding the source following the source of approval process established in AFMCI 23-113, "Pre-Award Qualification of New or Additional Parts Sources and the Use of the Source Approval Request (SAR)"

A5.2.5. Review request for MRB or Class II ECP delegation for aviation CSIs using approved sources

A5.2.5.1. WSPCE evaluates each Commercial and Government Entity (CAGE) or sends to the commodity groups for evaluation

A5.2.5.1.1. If Navy or Army delegated - Evaluate DR history, Evaluate contract performance history (CPARS), and Ensure relationship established between AF and DCMA onsite rep

A5.2.5.1.2. Otherwise evaluate - DR history, QA Process, Discrepancy resolution process, Contract performance history (CPARS), MRB or Class II ECP process, DCMA involvement in MRB or Class II ECP process, Relationship established between AF and DCMA onsite rep, and Engineering Design Control Authority (DCA)

A5.2.5.2. If source does not meet criteria for delegation approval, WSPCE document decision

A5.2.5.2.1. Recommend not delegating authority

A5.2.5.2.2. Document rationale

A5.2.5.2.3. Provide input to Center EN

A5.2.5.3. Grant delegation unless analysis indicates otherwise

A5.2.5.4. WSPCE sends platform-consolidated response to their Wing Director of Engineering (DOE) who consolidates the Wing delegation packages and forwards to the Center EN. Wing DOE can override WSPCE decision to not authorize delegation if substantiation is deemed insufficient

A5.2.6. Center consolidation process

A5.2.6.1. Center EN gathers responses from all WSPCEs

A5.2.6.2. If all WSPCEs agree with delegation determination

A5.2.6.2.1. EN prepare Center consolidated response

A5.2.6.2.2. Coordinate and Sign response

A5.2.6.2.3. Send response to HQ AFMC/A4UE

A5.2.6.3. If there is a disagreement, Center EN convene team from the affected programs

A5.2.6.3.1. Each WSPCE present their rationale

A5.2.6.3.2. Difference discussed in order to strive for consensus. Wing DOEs to arbitrate within their wings; represent their wings in disagreement resolution at center level with Center EN home office support

A5.2.6.3.3. EN prepare Center consolidated response including rational for unresolved disagreements

A5.2.6.3.4. Coordinate and Sign response

A5.2.6.3.5. Send response to HQ AFMC/A4UE

A5.2.7. Command consolidation process

A5.2.7.1. HQ AFMC/A4UE gathers responses from Centers

A5.2.7.2. If all Centers agree with delegation determination

A5.2.7.2.1. HQ AFMC/A4UE prepare command consolidated response

A5.2.7.2.2. Coordinate response

A5.2.7.2.3. HQ AFMC/EN sign response

A5.2.7.2.4. Send response to DCMA, DLA, and other services

A5.2.7.3. If there is a disagreement, HQ AFMC/EN convene team from the affected Centers (including Wing DOEs)

A5.2.7.3.1. Each Center presents their rationale

A5.2.7.3.2. Difference discussed in order to strive for consensus

A5.2.7.3.3. HQ AFMC/A4UE prepare command consolidated response

A5.2.7.3.4. Coordinate response

A5.2.7.3.5. HQ AFMC/EN sign response

A5.2.7.3.6. Send response to DCMA, DLA, and other services

A5.2.8. Joint consolidation process

A5.2.8.1. DLA gathers responses from services

A5.2.8.2. If all services agree with delegation determination, DLA implements delegation decision

A5.2.8.3. If there is a disagreement, DLA convene team from the affected services

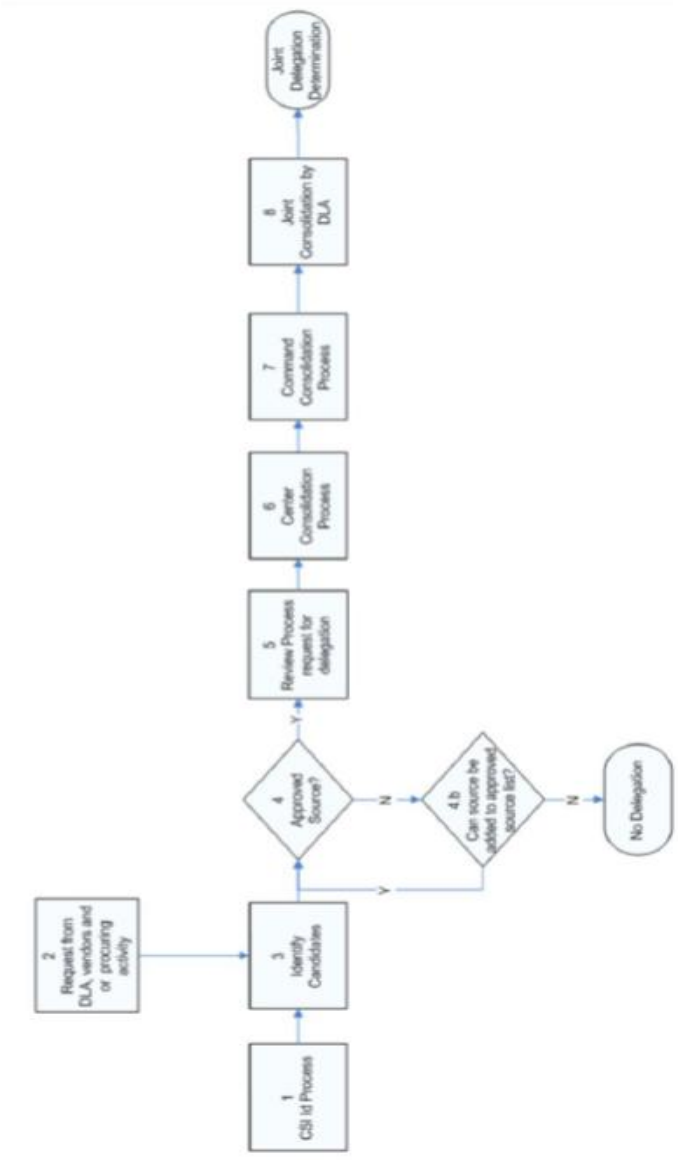
A5.2.8.3.1. Each service presents their rationale

A5.2.8.3.2. Differences discussed in order to strive for consensus

A5.2.8.3.3. DLA implements delegation decision

A5.2.8.3.4. DLA provides feedback to services on final decision

Figure A5.1. MRB Disposition Authorization Process.



A5.3. Class II ECP and minor nonconformance MRB Disposition Authority Management Process for aviation CSIs (See **Figure A5.2**)

A5.3.1. Decision is made to delegate minor nonconformance MRB or Class II ECP decision Authority for aviation CSIs. Class II ECP or minor nonconformance MRB decisions on aviation CSIs should be made available for review by the WSPCE. PQDRs will also be reviewed as indicators of source quality problems.

A5.3.2. MRB or Class II ECP decisions for aviation CSIs are made at the contractor's facility with DCMA concurrence

A5.3.3. DCMA onsite rep provides summary of relevant MRB or Class II ECP decisions at that site to the WSPCEs monthly

A5.3.4. WSPCE reviews MRB or Class II ECP Decision Summaries

A5.3.4.1. Review of actions assigned to appropriate engineer within the program office

A5.3.4.2. Engineer reviews the actions

A5.3.4.3. Engineer coordinates with other engineers as appropriate

A5.3.4.4. Engineer identifies potential issues

A5.3.4.5. Engineer reviews potential issues with WSPCE

A5.3.5. Are issues identified with the MRB or Class II ECP decisions?

A5.3.5.1. If No – No action required & process repeats quarterly (as a minimum)

A5.3.5.2. If Yes – WSPCE or designee contacts DCMA at the contractor's facility to discuss/understand issue and determine if any action is required

A5.3.5.3. Is action Required?

A5.3.5.3.1. If No – No action required & process repeats quarterly (as a minimum)

A5.3.5.3.2. If Yes – initiate DR process and Joint Resolution Process (Step 8, in **Figure A5.2**)

A5.3.6. Joint issue resolution process

A5.3.6.1. WSPCE or designee contacts center EN focal point

A5.3.6.2. Center EN focal point contacts other programs at that center which use that facility

A5.3.6.3. Center focal point contacts AFMC/A4UE

A5.3.6.4. AFMC/A4UE contact other centers as appropriate

A5.3.6.5. Teleconference is convened by AFMC/A4UE with DLA, DCMA, NAVAIR, and AMCOM POCs. Issue Resolution Team will consider at least the following items:

A5.3.6.5.1. Is this a systemic problem?

A5.3.6.5.2. Are the facilities processes adequate?

A5.3.6.5.3. Are the processes being followed?

A5.3.6.5.4. Are alternatives considered (should delegation decision authority be suspended or withdrawn, generation of corrective action plan, etc.)

A5.3.6.5.5. Develop a corrective action plan developed to prevent repeat occurrences (if appropriate)

A5.3.6.5.6. Implement corrective action plan and track, as appropriate

A5.3.7. Is removal of delegation decision authority agreed upon?

A5.3.7.1. If Yes – Initiate appropriate contact changes to implement corrective action plan and monitor progress of corrective action plan until delegation is appropriate

A5.3.7.2. If No – Continue to monitor activities at this facility closely and return to beginning of quarterly (as a minimum) review process

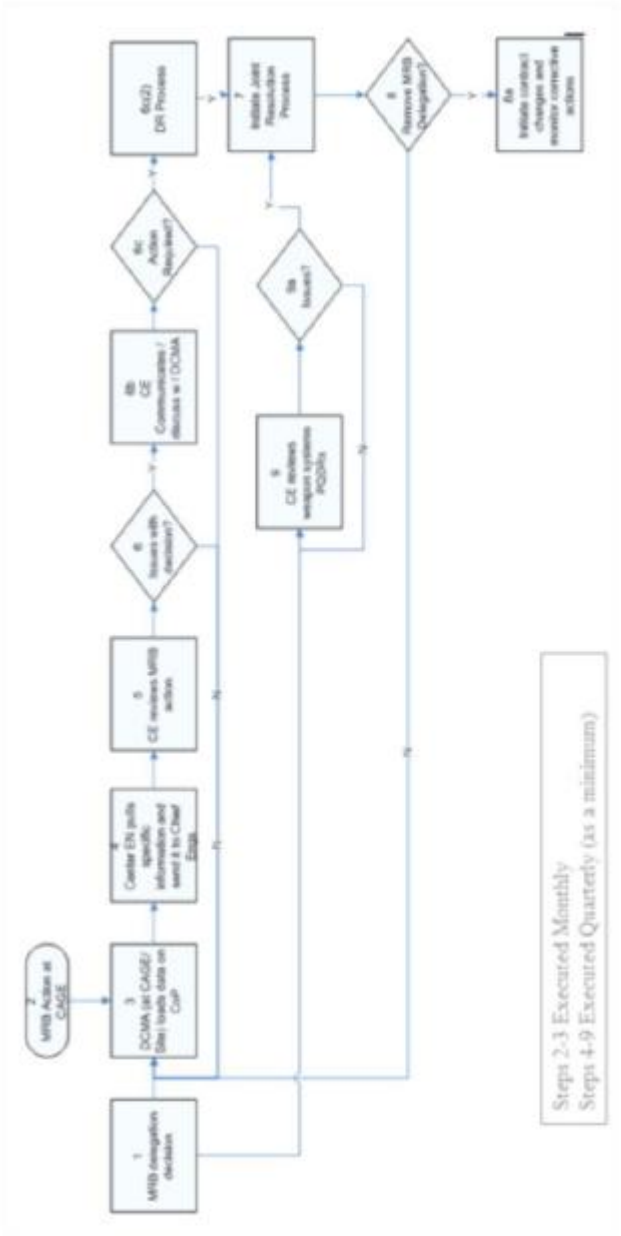
A5.3.8. WSPCE or designee review PQDRs and Deficiency Reports quarterly (as a minimum)

A5.3.8.1. Does there appear to be any systemic issues with a particular contractor location?

A5.3.8.1.1. If No – take no action continue review

A5.3.8.1.2. If Yes – Initiate Joint resolution process (step 8 a)

Figure A5.2. MRB and Class II ECP Disposition Authority Management Process for Aviation CSIs.



A5.4. Definition of Key MRB & Class II ECP for aviation CSIs Disposition Authority Management Process Terms

A5.4.1. Class I ECP criteria: An ECP proposing a change to approved configuration documentation for which the Government is the Current Document Change Authority (CDCA) or that has been included in the contract or statement of work by the tasking activity and:

A5.4.1.1. Affects any physical or functional requirement in approved functional or configuration documentation, or

A5.4.1.2. Affects any approved functional, allocated or product configuration documentation, and cost, warranties or contract milestones or

A5.4.1.3. Affects any approved product configuration documentation and one or more of the following (MIL-HDBK-61A, Table 6-2):

A5.4.1.3.1. Government furnished equipment

A5.4.1.3.2. Safety

A5.4.1.3.3. Compatibility, interoperability, or logistic support

A5.4.1.3.4. Delivered technical manuals for which changes are not funded

A5.4.1.3.5. Will require retrofit of delivered unites

A5.4.1.3.6. Preset adjustments or schedules affecting operating limits or performance to the extent that a new identification number is required

A5.4.1.3.7. Interchangeability, substitutability, or replaceability of any item down to non-repairable subassemblies

A5.4.1.3.8. Sources on a source control drawing

A5.4.1.3.9. Skills, manning, training, biomedical factors or human engineering design.

A5.4.2. Class II ECP Criteria: An ECP proposing a change to approved configuration documentation for which the Government is the CDCA or that has been included in the contract or statement of work by the tasking activity and which is not Class I. (MIL-HDBK-61A, Table 6-2)

A5.4.3. Critical Characteristics: Any feature throughout the life cycle of a Critical Item, such as dimension, tolerance, finish, material or assembly, manufacturing or inspection process, operation, field maintenance, or depot overhaul requirement that if nonconforming, missing or degraded may cause the failure or malfunction of the Critical Item. (AFI 20-106, SECNAVINST 4140.2, DA PAM 95-9, DLAI 3200.4, DCMA INST CSI (AV))

A5.4.4. Minor nonconformance means a nonconformance that is not likely to materially reduce the usability of the supplies or services for their intended purpose, or is a departure from established standards having little bearing on the effective use or operation of the supplies or services. (FAR 46.101)